Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	
Carrier Current Systems Including Broadband over Power Line Systems	ET Docket No. 03-104
Amendment of Part 15 Regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems	ET Docket No. 04-37

COMMENTS
OF
MAIN.NET COMMUNICATIONS LTD.

Pursuant to Section 1.415 of the Federal Communications Commission ("FCC") Rules, Main.net Communications Ltd. ("Main.net") hereby submits its comments in response to the Commission's above-referenced *Notice of Proposed Rulemaking, FCC 04-29*.[1] Main.net applauds the FCC's continued initiative in recognizing the benefits from the implementation of Broadband over Power Line ("BPL") and suggestions for minimizing regulatory uncertainty which will further development and implementation of BPL technology. Main.net supports the Commission's conclusion in paragraph 48 of the NPRM that Access BPL has the potential to offer a number of significant benefits. BPL

[1] *Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems*, Notice of Proposed Rule Making, *ET Docket No 03-104 and ET Docket No. 04-37; FCC 04-29* (February 23, 2004) *("FCC NPRM")*.

will increase the availability of broadband services to homes and businesses especially in areas where broadband access is limited due to cost or infrastructure constraints; will increase competition in the broadband service markets; and, will advance homeland security by providing a communication network where access exists wherever power is present. BPL also will revolutionize the electric industry by providing a two-way communication path over the electric distribution network which will improve electric distribution quality and reliability. Electric distribution automation will translate into immediate operational cost savings and lower electric rates to consumers.

Main.net and Its Technology. Main.net, a private company founded in 1999, is the world leader in the BPL Access market. Main.net and its subsidiaries develop and market a complete, flexible, and cost-effective broadband over power line communication solution. Main.net's PLUS™ (Power Line Ultimate System) technology and product line provide power utilities and operators with a solution that provides communication services over their existing low and medium voltage power lines infrastructure. PLUS integrates both Access and In-home networks into one single, efficient system.

In Main.net's 4+ year history we have had serious dialogue with almost every major power utility in the world. In the US, Main.net's utility customers include representation from the top 25 investor owned utilities who manage a combined total of almost 20 million meters. Main.net has successfully implemented its PLUS BPL system in technology trials, pilots, market trials and commercial operations with some of the largest power companies in the world in over 60 locations and in more than 20 countries.

Main.net's system is installed in Europe, Latin America, Africa, the Middle and Far East and in over 10 communities in the United States. Today, over 300,000 homes are passed by Main.net technology and over 20,000 households are using the technology. Main.net has installed and has in operation over 60,000 BPL devices of which over 40,000 are Access BPL devices. Main.net has demonstrated technical feasibility, scale and operability of the PLUS Access BPL system but more importantly to this proceeding, Main.net has shown that the PLUS Access BPL can effectively co-exist.

PLUS' main applications include broadband Internet service, telephony, home networking, power management and control including transformer outage notification, remote meter reading, capacitor bank control, remote traffic signal control, and in-home advanced services (i.e., home automation, advanced on demand and multimedia applications.) Main.net's technology can be installed and operated on any type of electric grid architecture and provides a fully integrated solution that is remotely managed and controlled and completely transparent to the operations of the electric distribution system.

The sophistication of the PLUS technology allows for fast, simple deployment. All PLUS network elements are remotely accessible, providing for superior customer service, ease of provisioning and instantaneous and remote software upgrades. The remote accessibility and control of the Main.net PLUS BPL elements provides for, among other things, adjustment of power levels and modification of frequencies in which they operate.

Main.net BPL system uses several types of devices:

- Medium voltage modems (CuPLUSmca™;RpPLUSmca™) that are inductively coupled to the medium voltage lines using couplers.
- Low voltage modems (CuPLUS™; RpPLUS™; NtPLUS™) that connect to any ordinary power source up to 450V.
- Management system (NmPLUS™) which enables remote management and control of the PLUS elements installed in the network.

Main.net's technology, G2, provides users with an effective maximum bandwidth of 10 Mbps, with a sustainable service level of 1.5-10 Mbps. These speeds are sustainable in the network which controls the load balancing and the service fairness between users. Main.net's G3 system will have an effective bandwidth of 100Mbps.

All Main.net's units are independent of the physical layer, and have the ability to integrate different physical layer/chipsets into the system. The transport and data link which is used in Main.net's system is fully transparent IP (TCP/IP, UDP/IP, PPPoE), thus enabling use of any standard application. The PLUS technology supports both symmetric and asymmetric bandwidth allocation.

Main.net's technology implements both Direct Sequence Spread Spectrum ("DSSS") [G1] and Orthogonal Frequency Division Multiplexing ("OFDM") [G2/G3]. In the future, Main.net may implement other chipsets using these and other modulation techniques.

Main.net agrees with the Commission and has demonstrated that the PLUS Access BPL, with its unique approach can operate successfully under the non-interference requirements of the Part 15 rules.

Definition of Access BPL. Main.net agrees with the proposed definition as presented in the NPRM. Main.net also submits that business models are being developed where the owner/operator of the Access BPL system will not be the electric power provider or a subsidiary of the incumbent electric power provider. This model, sometimes referred to as the "Landlord" model, already has been introduced by the City of Manassas, VA which issued the first of its kind (in the US) BPL franchise in October 2003. Under this franchise the City of Manassas provides access to the power grid but a third party, unaffiliated with the City of Manassas, is responsible for the capital necessary to build the Access BPL network and is responsible for the operation, maintenance and marketing, customer acquisition and customer care of the BPL service as well.

Radiated Emission Limits. The Part 15 limits serve as a useful and effective reference. At this time Main.net does not request any changes to the limits. However, Main.net requests that the Commission consider allowing exceptions to the existing levels where it can be demonstrated that the potential for interference is unlikely. In Main.net's experience, an increase in limits can be implemented without causing harmful interference. Exceptions may be especially useful in rural areas and may accelerate BPL's adoption in these underserved or un-served communities. Since BPL is a Part 15 technology, operators of Access BPL systems would be responsible for eliminating any

harmful interference that may occur[2] even though an exception was allowed. Finally, with the incorporation of the Commission's proposed BPL interference mitigation techniques adequate protection to licensed users of the frequency bands is assured.

Conductive Emission Limits. Main.net agrees with the Commission's proposal to exempt Access BPL systems from conducted emissions limits for the reasons stated by the Commission in Paragraph 38 that, "…conducted emission measurements are very difficult to measure, and present safety hazards in connecting test equipment to these lines." We further agree with the Commission that this exemption would not have any impact on the interference potential. Main.net does not operate nor does it intend to operate Access BPL in the AM broadcast band (from 535 to 1705 kHz) .

Interference Mitigation. Main.net is sensitive to the concerns of all users of the frequency and agrees with the Commission regarding the importance of protection of licensed radio services from harmful interference and the requirement to incorporate capabilities to mitigate harmful interference should it occur. Main.net has incorporated in the PLUS system, techniques including remote frequency notching, remote power level adjustment and remote shut-down capabilities from the beginning of our technology development and with our first deployments over 4 years ago.

To the extent possible we also work proactively with the local community to reduce any anxiety concerning the potential of harmful interference. Specifically and most recently, Main.net along with officials from the City of Manassas, VA have met several times with the members of the Ole Virginia Hams Amateur Radio Club

[2] 47 C.F.R. § 15.5

("Amateur Radio Club") to discuss their concerns as well as to have the Amateur Club take measurements in active BPL areas within the City. Specifically, on April 6, 2004 and April 29, 2004, representatives from the City of Manassas, the Amateur Radio Club and Main.net visited both overhead and underground BPL neighborhoods. Main.net demonstrated to the group the BPL network was active and operational, where upon the Amateur Radio Club, using their monitoring equipment, determined that no harmful interference was present or caused by the PLUS BPL system. This experience has been effective in opening a fact based dialogue with the Amateur Radio Club. We are planning a number of events in the future that will include, among other things, meeting with the Amateur Radio Club members at an upcoming meeting that will be co-hosted by the City of Manassas and Main.net.

Main.net agrees with the Commission's proposed language for 47 CFR Part 15 § 15.109(f) which identifies three (3) mitigation techniques that can be adaptively or remotely initiated by the operator. These techniques are: 1) reduction in power, 2) adjustment in operating frequencies, and 3) a shut down feature. These techniques are currently part of the Main.net PLUS system and can be effectively used to address any localized, site specific interference issues while at the same time not materially impacting the rest of the system.

Notification Requirement. While Main.net can see some justification for a database that provides some limited information regarding Access BPL systems, we do not agree with the breadth and scope of information requested in the proposed rules. Main.net recommends that, if a public database is required, it contain only information at

a macro level referencing City and/or Town, Power Utility, Access BPL operator, and a toll-free contact number. This way, if someone were to have a concern regarding interference, they could quickly determine if the service was offered in their town or city and how to make contact with the operator to resolve any issues. More information than this would be cumbersome and costly to maintain, and possibly could contain sensitive information regarding the electric distribution network.

Main.net recommends the language in § 15.109(g) as proposed be modified to read, "(g) Entities operating Access Broadband over Power Lines systems…Such information shall include the ~~installation locations, frequency bands of operation, and type of modulation used~~ City/Town where deployed, Public Utility Entity, Access BPL Operator, Toll-Free Contact Phone Number, Mailing Address and Email Address. No notification to the FCC is required."

Equipment Authorization. Main.net agrees with the Commission's proposal to retain the Verification process for Access BPL. This procedure, which has proven effective with other technologies, should be continued with Access BPL and will provide for improved speed to market of equipment modifications and cost savings for the system developers, which translates into added value to the customer.

Access BPL Measurement Guidelines. Main.net supports the Commission's recommendation and proposed measurement guidelines. *In-situ* testing is currently the best method for evaluating FCC Part 15 compliance. Establishing standards around this testing will increase consumer confidence in the manufacture and system developers' verification and further insure that all testing is being performed to a similar standard.

However, while testing to three overhead and three underground representative locations increases the available data points it is a costly and sometimes intrusive process. Main.net has been fortunate in the past to be able to perform this number of *in-situ* tests. However, Main.net recommends that the measurements be limited to a total of four (4) locations with at least one (1) from a typical overhead and at least one (1) from a typical underground installation.

Conclusion

Main.net agrees with the Commission's proposed rule changes regarding the Definition of Access BPL, Conducted Emission Limits, Interference Mitigation Strategy, and Equipment Authorization. Main.net recommends changes be considered regarding Notification Requirements and Measurement Guidelines. We urge the Commission to continue its efficient and well thought out handling of this very important and exciting technology. BPL has the potential to dramatically change how businesses, consumers, educators and governments interact by providing ubiquitous, anywhere and instantaneous access. The simplicity and flexibility of being able to tap into a communication data port wherever electricity is found are obvious; the economic and social benefits - enormous.

Respectfully submitted,

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